

Grietjie Nature Reserve Fire policy and emergency procedures

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This document is divided into two distinct and separate sections-

1. Fire Management and management burning policy
2. Emergency procedures and protocols

1. Fire Management and management burning policy

Pre-amble

Grietjie Private Nature Reserve is situated in the Savannah biome and the ecosystems associated within this biome are shaped by the occurrence of fires. The reserve covers almost 3000Ha and is divided into 119 properties varying in size from about 12Ha-over 300Ha each. There are a number of developed properties with a variety of private residential properties and commercial ventures as well as a few undeveloped properties. The above system and its associated infrastructure create a difficult to manage scenario when it comes to fire and controlled burn management. This document takes into consideration all the above but also endeavours to create a policy that is based on responsible environmental management.

The following information has been extracted from the Ba-Phalaborwa FPA management plan.

Veldfires in the area of the Ba-Phalaborwa FPA and including Grietjie

Veldfires and climate

Veldfires occur mostly during winter, from about early May to late September, especially after the first frosts and before the first spring rains. During this period the winter climate and daily weather are dominated by two patterns:

- high-pressure cells that cause deep atmospheric inversions, and which persist for periods of days, resulting in relatively still air and moderate fire danger
- intermittent periods of one or two days or less when the passage of cold fronts to the south and east cause strong westerly winds and very low atmospheric humidity, causing high and extreme fire danger conditions.

Veldfires are small and slow-moving during inversions, but grow and spread rapidly, burning with great heat release during cold front episodes. Under the latter conditions, fires entering plantation forests and stands of invasive trees quickly grow to conflagrations, with crown fires.

Origins and causes of veldfires

Lightning is the only natural cause of veldfires in the Ba-Phalaborwa area. Lightning fires occur mainly in autumn and early spring. However, human influence goes back probably for at least 250,000 years, so that human-induced fires are equally part of the historic regime.

Currently, the reported causes and origins of wildfires are mainly the following:

- escaped management burns, when owners lose control of firebreak and other prescribed burns
- ignitions from negligent treatment of picnic, cooking or warming fires or disposal of ash from coal fires at farmsteads and resorts
- incendiaries in different forms
- lightning
- Wildlife poachers attempting to divert attention away from areas of operation or to destroy any poaching activity evidence.

Vegetation and fire behaviour

Table 1: Summary descriptions of the fire regime and fire behaviour in the main types of vegetation within the area of the Ba-Phalaborwa FPA

Vegetation or cover type	Approximate cover	Fire regime	Fire behaviour
Savannah biome – dominant tree species include red bushwillow (<i>Combretum apiculatum</i>), (<i>Acacia</i> spp.), tamboti (<i>Spirostachys africana</i>) and marula (<i>Sclerocarya birrea</i>), leadwood (<i>Combretum imberbe</i>), buffalo thorn (<i>Ziziphus mucronata</i>), (<i>Euclea</i> spp.) and mopane (<i>Colophospermum mopane</i>).	100 %	This savannah type burns mainly from May until the first rains in October; fires occur naturally about once in two years in any patch of savannah woodland that can sustain a fire. Managers of these protected areas apply “mosaic” burns, usually at the start and end of the fire season. These are small-scale burns under mild conditions, which are allowed to continue until extinguished by high humidity. Limited block burns are also applied.	During mild weather conditions (low temp – avg. 24 °C) and low wind speed (below 1.5 km/hour), high RH (above 70%), savannah fires move slowly, with the flame front in head fires moving at about 1-2 km/hour, with flame lengths of about 0.2 to 0.6 m. During dry windy frontal conditions (high temp (avg. 30 °C and high wind speed (10-15 km/hour), low RH (below 40%), savannah fires move at speeds up to 6-8 km/hour, with flame lengths of 1- 4 m.

Veldfire history on Grietjie since 2000

Our veldfire history can be easily summarised as follows:

2001, 11th Sept.

A fire that that originated from Enyatikulu when a firebreak got out of control on a very hot day spread across the majority of properties from 39 to the Grietjie gate. Almost all properties north of Darisandi road were affected as well as to the west of Zebra lane.

2002, November

A fire that originated from inside Doreen (presumed to be started by criminals after a burglary) spread across the Eastern side of Grietjie as far as the entrance road.

2020, 11th July

A fire that is presumed to have started by an electrical fault during excessive winds affected most properties to the east of Berg Road and north of Darisandi and all the way into Doreen and Maseke.

A number of smaller fires over the last 20 years have also occurred but these were insignificant by comparison and there is limited data available on them.

It is important to note that from 2002 until 2020 the grass cover throughout the reserve yielded quite low volumes hence the reason for the lack of fires. However with this also comes the mindset that fires are not a risk. Grietjie Reserve needs to implement a responsible management plan regarding the control of runaway fires but also the controlled management burns to ensure that the risk is reduced and the biodiversity of the reserve is protected at all times.

Patch Mosaic Burning option

Kruger NP switched to a patch-mosaic burning system without firebreaks in 2002, basically imitating the way in which indigenous people used to and still burn large parts of Africa every year.

With this in mind Grietjie will need to develop a plan where we can copy this system where possible. There are issues that will be created in our specific set-up in that there are many infrastructure risks which will need to be protected.

In conservation areas such as GPNR, the primary objective of fire management should be to increase or maintain biodiversity. It is argued that the best way to achieve this is to mimic natural fire regimes as closely as possible through patch mosaic burning (PMB) techniques. However, PMB can be used in a variety of land uses including commercial forestry, rangelands and agriculture as it reduces the risk of wildfires and the detrimental economic implications thereof. PMB requires less manpower, thus reducing costs associated with management (Trollope & Trollope, 2015). In places like Grietjie, PMB is also used to reduce combustible material loads under controlled conditions in order to reduce risks later in the season when hot and dry conditions can cause runaway fires.

A workshop presented by Kruger-to-Canyons Biosphere Region and MTPA which outlined the principles of PMB was attended by reserve management recently.

BURNING FOR BIODIVERSITY
Guidelines for Patch Mosaic Burning in High Altitude Grasslands

In conservation areas, the primary objective of fire management should be to increase or maintain biodiversity. It is argued that the best way to achieve this is to **mimic natural fire regimes** as closely as possible. This can be achieved through **patch mosaic burning (PMB)** techniques. PMB is a burning strategy used to create a fine-grained mixture of different post-fire age patches, randomly spaced across the landscape. The focus of patch mosaic burning is to create **heterogeneity** across the landscape while also reducing fuel loads.

PMB can be used in a variety of natural landscapes as it contributes to achieving biodiversity & ecological objectives while simultaneously having management and logistical benefits too.

BENEFITS OF PATCH MOSAIC BURNING

- ECOLOGICAL BENEFITS:**
 - Maintain or enhance natural ecological processes.
 - Creates heterogeneity in the landscape.
 - Prevents fuel loads from reaching levels that could increase the risk of runaway fires.
 - Coastal, slow moving fires allow time and space for non-dependent animals to escape or hide in local fuel-free areas.
 - Prevents the destruction of wetland hot spots of a area excluded from the fire.
- LOGISTICAL BENEFITS:**
 - Can be safely executed to avoid accidents or the loss of people or property.
 - Significantly reduces risk of runaway fires.
 - Significant change can be achieved on a budget and on a small scale.
 - Collaborative burning between neighbouring farms reduces workload of individual firebreaks and tracer fire.
 - Can be used to create firebreaks.
 - Identification of high risk areas (buildings, water lines, etc.) can be conducted & avoided or with significant adjustment of existing practices.

PRECAUTIONARY: The precautionary principle should always apply. **"If uncertain, don't burn!"**

PRINCIPLES & STEPS FOR CONDUCTING A PATCH MOSAIC BURN

- COMPLIANCE:** Always comply with relevant regulations and always pre-approval of fire permits.
- PHYTOMASS:** Fuel load material should be sufficient to carry a fire under most & cool conditions. Areas where overhead material is absent or so sparse should be "skipped" or burnt with an area for a catch and safety of people with a fire extinguisher.
- SLOW:** The speed of fire should be slow to burn if it burns, the dead post material slowly falling to the ground will not trigger by narrow burning strips as pathways remain open to firefighters. Two risk areas areas of sparse vegetation or recently burned areas.
- WIND:** Wind should either be absent or slow enough for fire to be controlled at relatively high flame heights.
- AREA SIZE:** When burning the size of the area selected should be small enough for the conditions to change to a negative condition.
- PATIENCE:** Avoid trying to burn "quick" large burns. Take your time and be patient.
- PRECAUTIONARY:** The precautionary principle should always apply. **"If uncertain, don't burn!"**

PMB is intended to mimic natural fire scenarios more closely, and burns are **not very hot** so **natural boundaries** such as rivers, cliffs, and indigenous forests can be used to delineate fire management blocks. Management blocks can therefore vary in size.

The Patch-mosaic burning concept aims to **avoid stereotypical dry season** (e.g. firebreaks) and **spring burning** (or grazing) practices. It is also considered less intrusive to biotic diversity as it attempts to strike a **balance** between natural fire and management requirements. According to this concept, **fire can be applied throughout the year** when lightning fires are likely to occur, and thus **avoid dry hot conditions**. The fire return period is primarily dictated by the presence of moribund material.

Patch-mosaic burning may present a **practical alternative** for burning programs in conservation areas if applied under specific conditions. It requires less staff, reduces fire risk, burns under lower risk conditions, is aesthetically more pleasing, and reduces the need for annual firebreaks and tracers on repetitive strips.

To access the Patch Mosaic Burning Guidelines compiled by Kruger-to-Canyons Biosphere and Mpumalanga Tourism & Parks Agency, go to <https://kruger2canyons.org/resources/>

environmental affairs
Department of Environmental Affairs
REPUBLIC OF SOUTH AFRICA

SANBI
Biodiversity for Life
South African National Biodiversity Institute

gef
Global Environment Facility

UNDP
United Nations Development Programme

It will be incumbent on the management of the reserve to be able to give ample warning to property owners as to what regions of the reserve are considered as potential burning blocks for the following months so that adequate firebreaks can be created in advance. Management will ensure that an adequate firebreak around the perimeter

of the reserve is maintained as required by law, but that all internal firebreaks around infrastructure must be maintained by the owners of such properties.

Before any management burning can be conducted a permit needs to be issued by Dept. agriculture, land reform and rural development, as is required by the National Veld and Forest Fire Act (Act No. 101 of 1998). This application will be submitted by the reserve management and a copy of the application sent to the Ba-Phalaborwa FPA. An inspection will be carried out to ensure that the conditions for a fire are sufficient and no burning may take place without this.

Under no circumstances are individual owners permitted to apply for or conduct management burns independently.

Constitutional implications

According to the GPNR constitution the following clauses are relevant:

20 FIRE MANAGEMENT

- 20.1 A Firebreak will be provided in the boundaries of the RESERVE. This will be in accordance with any conditions imposed by the Law and the rule of the Fire Protection Association, if any.
- 20.2 The COMMITTEE, on behalf of its MEMBERS will apply to the Minister for an exemption from the requirements of Chapter 4 of the National Veld and Forest Fire Act 101/98 re “that every Land Owner must prepare and maintain a firebreak” around the perimeter of their Property.
- 20.3 The rules and regulations of the relevant Fire Protection Association, if any, shall be binding on all MEMBERS.
- 20.4 The WARDEN, or his representative, shall be the direct liaison with the Fire Protection Officer appointed by the Minister and all fires, whether planned or accidental shall in the first instance be reported to the WARDEN.
- 20.5 Landowners on the borders of the reserve will give their support in the preparation and maintenance of boundary firebreaks.

11 DUTIES OF MEMBERS

- 11.6 To support the Fire Policy in Section 20 and further
 - 11.6.1 Not to hold any other MEMBER liable for damage caused by a fire spreading from one plot to another, save for any gross negligent activity that a MEMBER has committed which has resulted in the spread of a fire and subsequent damage.
 - 11.6.2 To ensure that proper control of all fires started on the reserve; including employees cooking fires are maintained in order to prevent the spread of such fires.

Controlled Management burning policy

The reserve management in consultation with scientists from ARC (Agricultural Research Centre) will consider the need for management burning for any specific year. Decisions will be based upon climatic conditions, health of the ecosystem in terms of biomass and seasons, suitability and availability of staff and resources. Any area of land that is earmarked for burning will be communicated to respective landowners in advance, allowing for property owners to ensure their dwellings are protected through the maintenance of suitable firebreaks etc.

It will be the responsibility of the warden to ensure all legal protocols are adhered to and permissions obtained

Warden responsibilities

1. Communicate to land owners the intention to burn in their vicinity at least 2 months beforehand.
2. Compile required evidence through annual reports from ARC as to fuel loads etc
3. Extract information if available from ARC reports as to recommendations to burn.
4. Submit application to conduct a management burn to relevant authorities at least 30 days before the intended burning date.
 - a. BURNING VELD FORM
5. Ensure all reserve equipment has been serviced and is ready for use
6. Enlist additional support from landowners if they are qualified firefighters and are willing to volunteer.
7. Ensure that proper records are kept of areas that have been burnt.

References:

- **BURNING FOR BIODIVERSITY**

Guidelines for Patch Mosaic Burning in landscapes with an emphasis on high altitude grasslands.

Compiled by Frik Bronkhorst (MTPA), Romy Antrobus-Wuth and Nicholas Theron (K2C BR NPC)

For The Biodiversity and Land Use (BLU) Project

- **Business Plan for the Ba-Phalaborwa Fire Protection Association**
- Conservation Matters- GPNR newsletter July 2020 by Dr F Venter.
- Various Ranger reports from Grietjie wardens dating back to 2001
- Constitution of Grietjie Private Nature Reserve-version 16 September 2020

5. Emergency procedures and protocols in case of runaway accidental fires

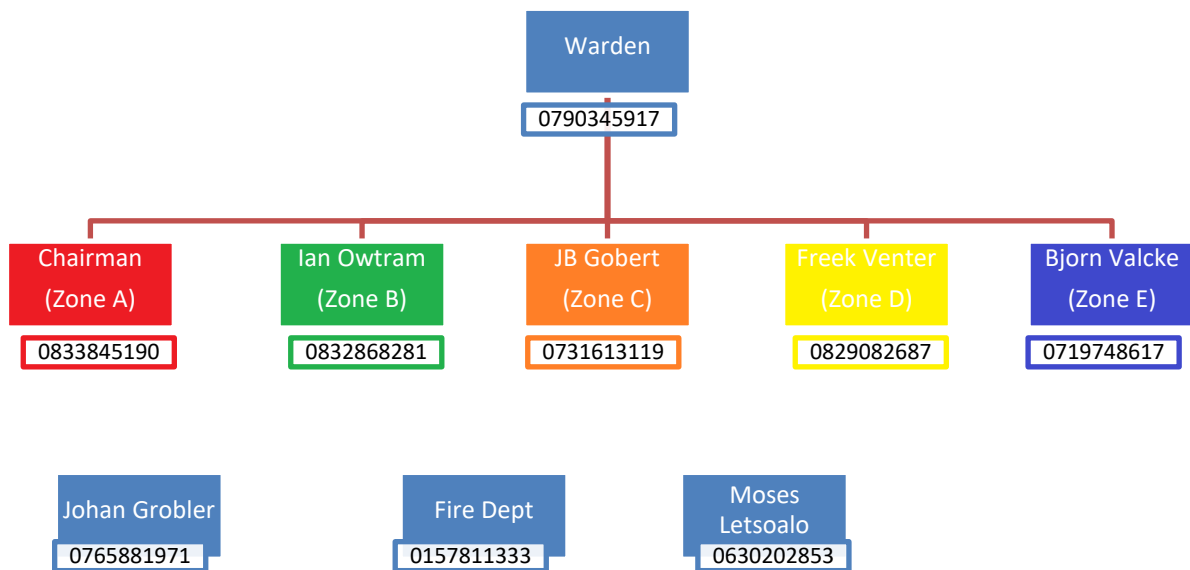
Point of contact

In the event of a fire being discovered on the reserve the following procedures should be followed.

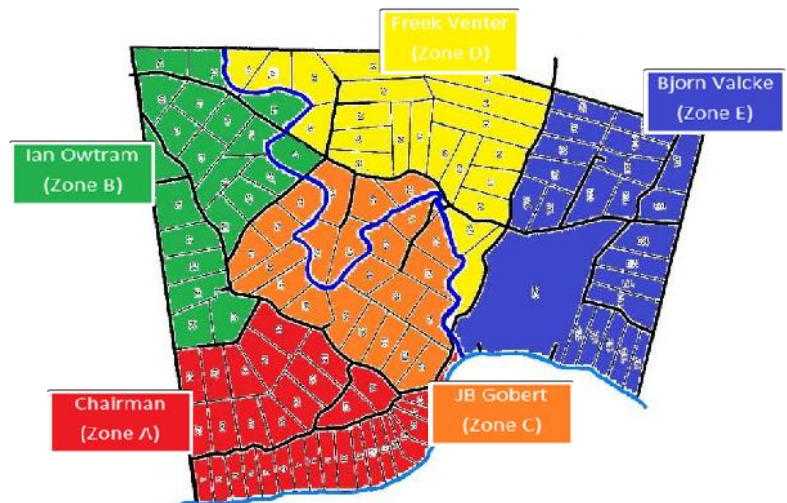
1. Contact the reserve warden on his cell phone 079 034 5917 or via the radio
2. Should he not be available then contact the person designated for the respective zone as follows:
Zone A: Ian Nowak (Chairman)
Zone B: Ian Owtram (Antares Bush Camp, plot 39)
Zone C: JB Gobert, (Lions Place, plot 51)
Zone D: Dr. Freek Venter, (Bakgat, plot 92)
Zone E: Bjorn Valcke, (Mbizi Bush Lodge, plot 109)

Alternatively if there is no other option contact these people/Departments

- a. Johan Grobler, Plot 108 Cell: 076 588 1971
- b. Phalaborwa Fire Department, Tel: 015 781 1333
- c. Moses Letsoalo (Chief Fire Officer in Phalaborwa), Cell: 063 020 2853



The five Fire Zones that the reserve has been split into



Procedures to be followed and information required

1. The following information is important and should be given over in as much detail as possible.
 - a. Location, property number or road as accurately as possible.
 - b. Type of fire, veld fire, building etc
 - c. State of fire, small, large, out of control etc
 - d. Your contact details
 - e. How many people on site if any
2. If you are trained to, able to and have equipment with you then start to try and control the spread of the fire.
3. If the fire requires many people then send a message via the Grietjie Chat WhatsApp group and stop any passers-by and request assistance. Should specific equipment be required please request this so relevant people can respond.
4. During the operation it is important that one person is designated as the controlling officer and all messages should be relayed through and from this person **only**. They should only be concerned with receiving and transmitting information and co-ordinating where assistance is required. They should not get involved with actual fire fighting responsibilities. All new people arriving should report to them for instructions. This information is important to send out when asking people for assistance to ensure that a professional and well-coordinated approach is maintained at all times. Ideally this person must be given a radio or have access to one so as to transmit messages across many fronts.
5. Once the fire is brought under control it is important to continue to monitor the area for any possible flare-ups. Any burning logs and embers must be extinguished with water and if possible moved further away from the edge and into the burnt area.
6. A full report must be written up and recorded. This report must be kept by reserve management and a copy sent to the Ba-Phalaborwa FPA for their annual reporting and record keeping.
7. Any equipment that was used in the operation must be immediately cleaned, repaired and made ready for the next possible emergency.
8. Bakkie sakkies must be regularly serviced and kept full and ready for action at all times.

Important contact details for equipment and training

1. Phalaborwa Fire & General-
 - a. 015 781 2101 (head office)
 - b. 062 759 4956 (Hoedspruit branch)
2. Aquila Training- 013 767 1224
3. Star Spares (Tzaneen)- 015 307 1849
4. Inzinga – David Du Plessis 078 652 6521

Recommended equipment for owners

Preferable equipment

1. 2 fire beaters
2. A strong rake (ideally without a metal handle as it gets HOT!)
3. A back-pack sprayer
4. A radio with the reserve channel programmed in for emergencies

Good to have but not essential

5. Leaf blower
6. Chainsaw
7. Brushcutter or slashers

It would be good if all owners can create a register of what equipment they have and if it would be made available during an emergency and where it is located. This information can be kept on record by reserve management. Owners are invited to email me any equipment information they would like to be kept on record by the reserve and I will create a list which we can maintain going forward